38th Annual Meeting, APS Division of Plasma Physics
11-15 November 1996, Denver, CO
Abstract Submittal Form

Deadline: Wednesday, 10 July 1996

Subject Classification Category _____ ☐ Theory ☐ Experiment
(Refer to the DPP Subject Category list on page M19.)

UCRL-JC-124673 Abs

Weakly nonlinear evolution of interface instabilities,* M.Berning,[1] A. Rubenchik,[2] M. Wood-Vasey,[3] 1) Düsseldorf University, 2) University of California-Davis, 3) Harvey-Mudd College. We have developed a Hamiltonian formulation for hydrodynamic interface instabilities in incompressible liquids. The interface evolution equations of Haan[1] are extended to third order perturbation theory. Our nonlinear theory takes into account the temporal variation of the interface acceleration, final layer thickness, and material ablation. The analytical description of 3D hexagonal and rectangular structures was also developed. We incorporated these results into a model that evaluates the instability evolution by post processing the output from simulations with the 1D radiative hydrodynamics code HYADES. We evaluate the growth of the fundamental mode and higher harmonics during the early nonlinear stages of perturbation evolution into bubbles and spikes. These results were used to interprete experiments done on the Nova laser to compare the Rayleigh-Taylor instability evolution at an ablation front versus at an embedded interface.[2] *Work performed under the auspices of the U.S. Department of Energy by the Lawrence Livermore National Laboratory under contract number W-7405-ENG-48.

[1]S.W. Haan, Phys. Fluids B **3**, 2349 (1991).

[2]K.S. Budil *et al.*, Phys. Rev. Lett. **76**, 4536 (1996).

☐ Prefer Poster Session
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